

oral presentation - session: Phytopathology

Pathogenicity and detection of *Fusarium* spp. causing internal fruit rot in bell pepper

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Internal fruit rot can be a serious problem in the production of greenhouse-grown bell peppers. The disease is caused through infection of the flowers by members of the *Fusarium lactis* species complex (FLASC), which contains multiple sequence types (STs), and to a lesser extent by *F. proliferatum* and *F. oxysporum*. The objectives of this study were to evaluate host susceptibility as a function of the *Fusarium* species and to determine the air load and sources of inoculum in the greenhouse.

Fruits of four pepper cultivars were separately inoculated with FLASC ST1, FLASC ST2, FLASC ST5, FLASC ST9, *F. proliferatum* and *F. oxysporum*. In a second experiment, only FLASC ST1 was used to inoculate fruits of 5 yellow and 5 red cultivars. Lesion size was significantly larger on yellow cultivars and *F. oxysporum* produced the largest lesions.

To evaluate the potential of the *Fusarium* species to infect flowers, two cultivars were inoculated by applying a spore suspension of FLASC ST1, FLASC ST2, FLASC ST5, *F. proliferatum* and *F. oxysporum* on the stigma. In a second experiment only FLASC ST1 was used to inoculate flowers of 10 cultivars. Fruits were sampled two weeks after inoculation and in the first experiment also at harvest. After surface sterilization, samples were placed onto PDA medium, incubated and evaluated for the presence of *Fusarium*. All five *Fusarium* species were equally able to infect flowers, but infection was dependent on the cultivar.

It is believed that *Fusarium* spores spread to the stigma via air movements. We developed a molecular method to quantify spores of FLASC, *F. proliferatum* and *F. oxysporum* using sampling, DNA-extraction and specific real-time PCR assays. This method was used to monitor the air load of *Fusarium* spores during a growth season. In general, spores were present in high numbers in spring and became less abundant later in the year. Of the three species, FLASC spores were the most numerous. The detection method was also applied to samples from surfaces, taken with cotton swabs. Horizontal surfaces such as the concrete pathway, plastic soil cover and rock wool substrate usually contained large numbers of spores. Also, several samples of organic residue that had dropped onto the plastic cover were tested. In many cases small aborted fruits harboured a very large number of FLASC spores, indicating that they might be an important source of inoculum.

Key words: *Capsicum annuum*, spore sampling, real-time PCR